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ABSTRACT

In two college counseling client samples, 29 two-need Edwards Personal Preference Scale (EPPS) patterns were found to occur frequently, 13 involving high achievement. The prediction of college grades in these two samples was studied utilizing these EPPS patterns, a set of traditional aptitude/achievement measures, and patterns combined with traditional measures. Personality patterns did not improve prediction from aptitude and achievement variables in the weight determination sample and in cross-validation actually cancelled out predictability from traditional measures. Prediction of college grades from high school grades and aptitude tests was, on the other hand, both accurate and consistent. (Author)

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EPPS Patterns and Academic Achievement in Counseling Clients

Patricia W. Lunneborg

In two college counseling client samples 29 two-need EPPS patterns were found to occur frequently, 13 involving high achievement. The prediction of college grades in these two samples was studied utilizing these EPPS patterns, a set of traditional aptitude/achievement measures, and patterns combined with traditional measures. Personality patterns did not improve prediction from aptitude and achievement variables in the weight determination sample and in cross-validation actually cancelled out predictability from traditional measures. Prediction of college grades from high school grades and aptitude tests was, on the other hand, both accurate and consistent.

EPPS raw scores and EPPS patterns involving two needs, e.g., high achievement with low abasement, have failed to account for college grades among counseling clients to any useful extent (Lunneborg & Lunneborg, 1966, 1967). Although these personality measures are of little use for predicting grade point averages (GPA's), a more important question is whether or not they have practical value in augmenting traditional aptitude/achievement measures known to account for the bulk of the reliable variance in grades. Shanker (1961) using college counselees found that EPPS need scores made a significant contribution to a battery of intellective predictors, but he judged that neither this contribution nor that of Strong or Kuder interest measures was large enough for any of them to be routinely adopted in a precollege testing program. It remains to be demonstrated, then, whether EPPS patterns possess incremental

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validity, i.e., whether they add enough to the established validity of aptitude/achievement measures to justify the cost of administering the EPPS to all counseling clients.

The aptitude/achievement measures to be supplemented are the elements of the Washington Pre-College (WPC) Test Battery required of all high school seniors intending further education in the state. The predictors consist of age, sex, 6 high school (HS) GPA's taken from transcripts, and 12 tests.

Method

Subjects. Two student samples were employed in this study. The first sample of 600 counseling clients (300 of each sex) was used in the author's two EPPS studies previously cited and was seen at the University of Washington Counseling Center 1961-65. The second sample, 54 females and 134 males, consisted of all counseling clients first seen between January 1966 and June 1968 who had taken both the EPPS and the WPC battery.

Procedure. The first sample was used to identify frequently occurring 2-variable EPPS patterns among counseling clients. The only combinations considered were low-low (L-L), low-high (L-H), high-low (H-L), and high-high (H-H) where a low score represented a first quartile score and a high score represented a fourth quartile score for that sex among Edwards' college normative population. For a given pattern to be considered frequent it had to occur for more than 10% of the 600 students. The second sample was then searched for patterns identified as frequent in the first, and again, a pattern had to occur for more than 10% of subjects. Thus, the final set of patterns had occurred more than 10% of the time in each of the two samples.

Next, for the second sample frequent EPPS patterns were correlated with the 15 EPPS raw scores, 18 WPC variables, and all-university cumulative GPA. The cumulative GPA was based on all work taken by students through spring quarter 1968 and thus represents differential amounts of credit. These correlations were used for sequential predictor selections in which GPA was predicted from (1) WPC variables, (2) EPPS patterns, and (3) WPC variables and EPPS patterns. For each of these sets of predictors variables were selected until the shrunken multiple correlation (R_c) dropped, signifying that no additional reliable variance would be attained by selecting any more predictors. Prediction weights were then determined for the three best sets of five predictor variables. These weights were applied to WPC data and EPPS patterns in the first sample (N = 436 with WPC as well as EPPS) and the resulting predictions of university GPA compared with those for the second (predictor selection) sample.

Results and Discussion

There were 69 frequently appearing EPPS patterns in the first sample. The needs most represented in these patterns were high achievement, low affiliation, low dominance, and high and low order. Twenty-nine of these patterns were found frequently in the second sample where high achievement in combination with other needs was again apparent.

Table 1 illustrates the efficacy of WPC vs. EPPS variables as single predictors of all-university GPA. HS GPA's were the best class of predictors followed by the aptitude/achievement tests, particularly the verbal elements. EPPS raw scores, on the other hand, correlated from -.09 to .10 with GPA and EPPS patterns from -.14 for Ach H-Suc L to .17 for Ach H-Aba L with GPA, none of which was significantly different from zero at the .01 level.

Given that the 29 EPPS patterns did not correlate significantly with the GPA criterion their potential role as predictors was necessarily limited to that of suppressing irrelevant variance in WPC predictors. An examination of the zero-order correlations of EPPS patterns with WPC variables suggested that in multiple correlation the patterns might in fact extend the predictive usefulness of the verbal tests with which they were most consistently correlated as may be seen from Table 2.

When predictor selections were continued until R_c^2 dropped, from the set of WPC variables seven were selected with $R_c^2 = .26$; from the combined set of WPC and EPPS patterns, 16 predictors were selected with $R_c^2 = .34$. The 16 included 6 WPC variables (3 tests and 3 HS GPA's) and 10 EPPS patterns, 7 of which involved high achievement. R_c^2 represents the proportion of variance in the criterion for which the selected predictors could be expected to account in a new sample. The larger R_c^2 for the combination of WPC and EPPS would appear to justify using both kinds of measures to predict GPA. However, because such a large number of patterns was selected, it is almost certain that their weights would be unstable in cross-validation. By limiting the number of variables to be selected in predictor selection analyses and basing weights on the best four or five or whatever number is practical for a given situation, it is more likely in cross-validation that such weights will be stable and, in this instance, that the utility of EPPS patterns more reliably demonstrated.

Table 3 lists in the order selected the five best variables in selection analyses. WPC variables alone appear as good as when complemented by EPPS patterns. The expected contribution of patterns as suppressor variables was

Table 1

All-University GPA Related to EPPS Scores and Patterns, Aptitude and Achievement Measures

WPC variables				EPPS variables					
Aptitude tests	r	High school grades	r	Raw scores	r	Patterns	r	Patterns	r
Vocab	27	English	44	Ach	06	Ach H-Def L	11	Ord L-Exh H	-09
Engl usage	26	Foreign lang	37	Def	-04	Ach H-Ord L	05	Ord H-Exh L	-05
Spell	22	Mathematics	40	Ord	-04	Ach H-Exh H	-09	Ord L-Aut H	00
Read speed	13	Natural science	43	Exh	-08	Ach H-Aut H	02	Ord L-Chg H	-00
Read comp	22	Social studies	45	Aut	10	Ach H-Aff L	-00	Ord H-End L	05
Data suff	20	Electives	25	Aff	01	Ach H-Suc L	-14	Exh H-Aff L	-09
Quant judg	13			Int	09	Ach H-Dom L	02	Exh L-Dom L	06
Func rela	08			Suc	10	Ach H-Aba L	17	Aff L-Suc L	-07
Appl math	15			Dom	-06	Ach H-Nur L	08	Aff L-Nur L	01
Math ach	13			Aba	-09	Ach H-Chg H	01	Aff L-End H	-01
Space abil	-00			Nur	-03	Ach H-End H	-01	Int H-Suc L	04
Mech reas	-08			Chg	01	Ach H-Het L	03	Suc H-Dom L	01
				End	-06	Ach H-Agg L	-07	Suc L-Nur L	-08
				Het	00	Def L-Ord L	13	Dom L-Aba H	-04
				Agg	03	Def L-Aut H	13		

Note.--Decimal points omitted. For N = 188 $r \geq .19$ at .01 level of significance.

Table 2

Aptitude and Achievement Measures Related to EPPS Raw Scores and EPPS Patterns

(Decimal points omitted)

EPPS variables	Aptitude and achievement variables																	
	Vocab	Engl Usage	Spell	Read Speed	Read Comp	Data Suff	Quant Judg	Func Rela	Appl Math	Math Ach	Space Abil	Mech Reas	HS Engl	HS For Lang	HS Math	HS Nat Sci	HS Soc Stu	HS Elect
Ach	16	10	03	-06	11	23	15	19	15	20	11	24	-03	-09	07	02	-03	01
Def	-25	-13	-10	02	-14	-15	-19	-11	-20	-09	-11	-17	-09	-12	-07	-10	-04	-11
Ord	-11	-10	-04	-02	-11	-01	-07	03	-02	03	-04	-11	06	-03	01	00	00	02
Exh	05	-02	-05	-09	04	13	10	04	02	05	-02	15	-06	-08	-08	-01	-07	-07
Aut	11	14	05	-06	07	06	11	-03	08	08	11	29	-05	-04	03	04	-07	-10
Aff	07	10	10	18	15	11	14	10	17	10	11	-07	10	20	13	11	08	04
Int	04	-04	05	06	03	-14	-14	-17	-10	-15	-00	-08	06	02	-07	-10	-08	-07
Suc	12	14	10	07	08	08	04	13	06	11	-06	-05	17	19	13	21	18	15
Dom	-06	-14	-20	-01	-11	-10	-08	-07	-15	-12	-09	06	-17	-17	-11	-12	-08	-03
Aba	-22	-18	-06	-10	-13	-02	-01	-05	-01	01	06	-12	03	03	08	-03	08	03
Nur	00	17	13	12	09	-02	06	02	06	-02	-01	-17	10	20	12	07	02	10
Chg	15	14	10	02	12	02	00	07	01	-06	05	09	05	07	-01	13	03	04
End	-12	-10	-12	-00	-06	-07	-13	-03	-08	-04	-04	-15	-03	-07	-08	-08	01	01
Het	05	-00	04	-03	-03	-02	03	-09	02	-04	-04	12	-06	-02	-04	-13	-03	-06
Agg	03	-04	-05	-09	-06	-02	03	01	-00	01	-03	08	-12	-13	-12	-01	-04	-01

N = 188

Table 2 (continued)

EPPS Variables	Vocab	Engl Usage	Spell	Read Speed	Read Comp	Data Suff	Quant Judg	Func Rela	Appl Math	Math Ach	Space Abil	Mech Reas	HS Engl	HS For Lang	HS Math	HS Nat Sci	HS Soc Stu	HS Elect
Ach H-Def L	29	18	14	08	18	25	20	13	20	14	01	07	09	10	04	13	08	19
Ach H-Ord L	14	12	10	-06	12	08	10	-02	04	01	08	09	01	05	04	09	-01	06
Ach H-Exh H	08	08	-01	-07	08	15	11	05	08	12	-01	17	00	10	07	06	00	01
Ach H-Aut H	11	07	07	03	09	04	-01	-07	-03	-05	10	16	01	-02	08	03	-06	-01
Ach H-Aff L	05	-01	04	-04	-05	08	03	05	02	08	03	12	00	-05	01	-06	-06	06
Ach H-Suc L	06	01	11	04	05	08	04	04	01	01	09	09	-07	-12	-08	-15	-21	-08
Ach H-Dom L	02	-05	05	00	01	05	05	13	12	08	-03	06	03	-06	04	01	-03	04
Ach H-Aba L	20	08	06	07	18	08	-02	04	02	-02	-08	00	11	09	05	16	08	07
Ach H-Nur L	15	-04	-02	01	10	04	-08	-04	-03	00	04	12	-01	-05	-01	-07	-02	03
Ach H-Chg H	09	06	-00	-03	02	11	-01	01	02	01	01	05	04	02	08	07	-03	05
Ach H-End H	-04	-08	01	07	05	03	-05	15	07	05	08	06	-01	-13	-05	-10	-15	-01
Ach H-Het L	08	09	02	09	17	10	03	16	11	10	04	00	-02	-05	-01	04	-04	00
Ach H-Agg L	11	11	05	05	16	08	03	04	07	04	15	10	08	-01	13	00	01	02
Def L-Ord L	26	26	22	03	15	16	15	05	06	08	10	11	13	20	12	12	06	09
Def L-Aut H	25	26	27	11	22	19	14	04	12	10	13	17	15	19	19	14	10	05

Table 2 (continued)

EPPS variables	Vocab	Engl Usage	Spell	Read Speed	Read Comp	Data Suff	Quant Judg	Func Rela	Appl Math	Math Ach	Space Abil	Mech Reas	HS Engl	HS For Lang	HS Math	HS Nat Sci	HS Soc Stu	HS Elect
Ord L-Exh H	06	01	01	02	11	09	07	03	05	04	06	20	-12	-03	-04	06	-08	-13
Ord H-Exh L	-02	04	01	-04	02	05	08	09	09	05	01	04	02	08	09	-00	00	-01
Ord L-Aut H	05	11	06	-03	11	-02	03	-04	-04	-04	12	11	-04	00	02	-01	-09	-09
Ord L-Chg H	11	11	-01	-07	09	06	05	-02	03	02	10	11	02	01	00	10	03	01
Ord H-End L	09	08	09	-03	03	02	04	04	01	02	05	01	12	14	05	05	04	09
Exh H-Aff L	03	07	09	-10	-04	-00	-03	-09	-08	-06	-07	-01	05	02	-08	-04	-04	-01
Exh L-Dom L	05	02	03	06	05	01	04	06	04	05	00	02	07	12	11	05	11	00
Aff L-Suc L	-11	-17	00	-13	-14	-05	-15	-06	-12	-10	-06	-01	-08	-17	-06	-15	-08	-07
Aff L-Nur L	-01	-08	-01	-10	-09	-06	-16	-08	-15	-10	-01	01	-05	-07	-03	-16	-05	-00
Aff L-End H	-17	-17	-10	-03	-11	-16	-15	-10	-21	-13	-14	-07	-04	-14	-05	-06	02	02
Int H-Suc L	-11	-05	07	-10	-06	03	-01	-01	-01	02	09	02	01	-08	-01	-06	-11	-11
Suc H-Dom L	08	13	13	09	12	15	12	10	17	18	06	11	13	08	12	13	08	08
Suc L-Nur L	-03	-15	01	05	-02	04	-12	-03	-08	-08	05	03	-13	-16	-13	-16	-11	-11
Dom L-Aba H	-14	-15	-06	-03	-05	-00	03	-00	07	-08	01	-10	05	-00	07	01	09	-06

Table 3

Order of Selection and Weights for Three Best Sets of Predictors

WPC variables	β	
HS social studies GPA	.23	
English usage	.13	$R_c^2 = .25$
HS mathematics GPA	.18	$r_{cv}^2 = .31$
HS natural science GPA	.17	
Mathematics achievement	-.12	

EPPS variables	β	
Ach H-Aba L	.20	
Ach H-Suc L	-.25	$R_c^2 = .10$
Def L-Ord L	.20	$r_{cv}^2 = .01$
Ord L-Exh H	-.19	
Int H-Suc L	.15	

WPC and EPPS variables	β	
HS social studies GPA	.41	
English usage	.18	$R_c^2 = .26$
Ach H-Aba L	.18	$r_{cv}^2 = .02$
Ach H-Exh H	-.16	
Int H-Suc L	.11	

supported. When selections were made from both WPC and EPPS, three patterns were among the five measures selected and they increased the weights assigned HS social studies GPA and English usage. Despite this, the best set from both WPC and EPPS was no better than the best set from WPC alone.

Applying the three sets of beta weights in Table 3 to the WPC and EPPS data for the sample of 600 counseling clients predicted GPA's were obtained. Correlating these predicted GPA's with earned GPA's yielded r^2_{cv} also reported in Table 3. These values represent the proportion of criterion variance accounted for in the cross-validation sample using weights derived from the sample of 188. It is obvious that the EPPS patterns were exceedingly unstable predictors. Weighting these patterns optimally for the sample of 188 accounted for less than 1 percent of the variance in GPA in the cross-validation sample of 436. Similarly, when the best five WPC and EPPS variables in the sample of 188 were weighted, the patterns only served to disrupt the very good cross-validation correlation for WPC variables alone. The correlation was .56 for the weighted WPC set of five, and was .44 for HS social studies GPA and .37 for English usage, the two WPC variables in the best overall set of five.

The moral would appear to be that to account for college grades the best predictors are traditional aptitude tests and high school grades unsupplemented by personality measures. Personality patterns have again failed to live up to the hopes of many that they represented the unpredictable variance in school achievement.

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